KV Calibration

Attention: Newer systems contain B300 Boards – in this case you should use the Potentiometer or Pot which is noted in dashes behind it!! The position should be the same.

WARNING:
Electrical circuits inside the equipment use voltages that are capable of causing serious injury or death from electrical shock. Use appropriate precautions.

NOTES :
(a) Allow a 30 minute warm up time prior to performing the calibration.
(b) You can verify kV calibration with a calibrated, non- invasive meter such as the Keithley Triad System with the wide range filter pack or the Victoreen 4000 Plus.

1. Place a lead shield in the X- ray beam to protect the I. I. and the CCD camera.

2. Extend PCB B64 and clip the positive lead of your DVM on pin 17c on PCB B64. Place the negative lead on pin 31a. Refer to Figure 1 for the location of pins 17 and 31.

3. Manually select 75 kVp. Do not make an exposure. Adjust P1 on PCB B64 to achieve a reading of 10.125 VDC. Refer to Figure 1 for the location of P1.

4. Check the reference voltage on TP c (located between TP-f and 12V point) on PCB B54 for 6V DC (allowed from 5.95V to 6.05V). If not, adjust with R4 potentiometer which is located on the left edge of the B54 PCB.

5. Place the DVM lead on TP f on PCB B54 and use the ground reference on PCB B54 located within the Monoblock assembly card rack (Figure 2). TP- f represents the high voltage ratio of 10,000: 1.

6. Select a 75kV standard fluoro exposure and adjust R28 on the Control Rack B100 PCB (R49 on B300) (see Figure 1) so that the measured voltage on PCB B54 TP- f = 7.5VDC.

7. While taking a 36kV standard fluoro exposure, verify that the measured voltage on PCB B54 TP-f =3.6VDC.

8. While taking a 100kV standard fluoro exposure, verify that the measured voltage on PCB B54 TP-f=10VDC.

9. Repeat steps 6 - 8, if necessary.

>56 kV Hip Mode “HV Power” Calibration

1. Use your DVM to monitor the “HV Power.” GND = Chassis. Do this at either:

    a.) X1 - 2 or XP1 - 2 on the **Filter PCB** .
    b.) Positive (+) side on capacitor C1 in the power plate assembly. Capacitor C1 resides behind the terminal strip of the power plate assembly. Refer to **Figure 2** in the **Component Location Assembly/Disassembly** section of this service manual for the location of the terminal strip.

2. Manually select 36kV in the standard mode and note the voltage displayed on the DVM.

3. Select the hip mode.

4. While observing the DVM display, manually increase the kV and note at what kV the DVM display increases sharply. You should also hear a relay energize at this time. The relay should energize at 56kV - 57kV. If it does not energize at this time go to step 5. If it does energize, the kV calibration is complete.

5. Manually decrease the kV to 36kV and take an exposure.

NOTE:
This step should discharge C1 and return the charge to the lower value observed in step 2.

6. Adjust R29 on PCB B100 (R50 on B300) to obtain the results listed in step 4.

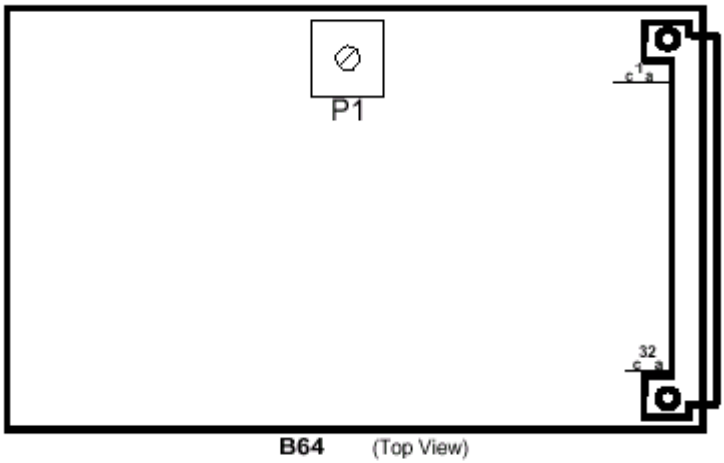

Figure 1

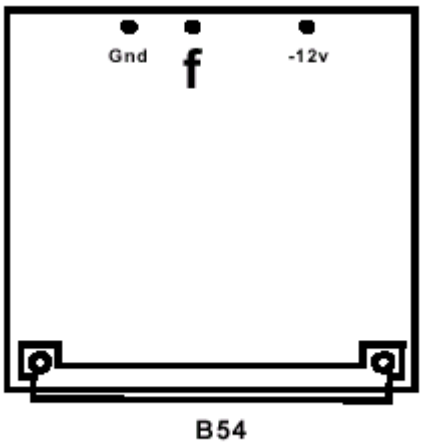

Figure 2

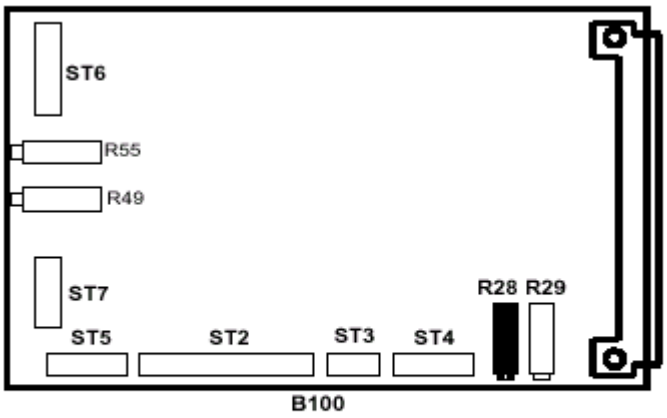

Figure 3

MA Calibration

WARNING:
Electrical circuits inside the equipment use voltages that are capable of causing serious injury or death from electrical shock. Use appropriate precautions.

NOTES :
(1) All adjustment Pots and Test Points are on the Control Rack PCB B143 unless instructed otherwise.
(2) Allow 30 minute warm up time prior to performing the calibration.
(3) Complete the kV Calibration prior to performing the mA calibration.

Fluoro

1. Remove the X- Ray tube cover.

2. Adjust P5 for a meter reading of 10VDC (± 5mv) on TP5 (TP6 Gnd).

3. Adjust P1 for a meter reading of 0VDC on TP3 (TP6 Gnd).

4. Place a meter (set to milliamps) in place of the mA jumper on the X- ray head assembly. Refer to **Figure 3** for the location of the mA jumper.

5. Place a jumper across R52 or jumper from TP8 to TP9 on PCB B143.

6. Select the manual fluoro mode and dial in 36kVp.

7. While making an X- ray, adjust the current to 150microA ±10microA with P3.

8. Remove the jumper across R52 or TP8 and TP9 on PCB B143.

9. Remove the meter and replace the mA jumper.

Film

1. Select the film mode and dial in 36kVp.

2. Place a voltmeter between TP6 (GND) and X3, pin 4 on PCB B143.

3. Press the handswitch button for less than 1 second, this will place K2 on PCB B143 in the film mode without producing X- rays, and adjust the voltage to 15.5 volts ±0.5 volts using P4.

4. Step 3 may have to be repeated to achieve the desired voltage output.

Overshoot

1. Select film mode and dial in 110kVp.

2. Dial in a time of 1.5 seconds.

3. Place a storage capable oscilloscope between TP1 (-) and TP2 (+).

4. Press the handswitch until the exposure terminates.

5. Check the leading edge for overshoot or undershoot. If either overshoot or undershoot occurs trim it with P4. Refer to Figure 2.

mA Output

1. Place a lead shield in the X- ray beam to protect the I. I. and the CCD camera.

2. Remove power to the system.

3. Place a meter, set to measure milliamps, across the mA jumper on the X- ray head assembly. Refer to Figure 18 for the mA jumper location.

4. Manually fluoro at 36kV, adjust P7 (**Figure 1**) for a meter reading of 0.2mA.

5. Manually fluoro at 80kV, adjust P6 (**Figure 1**) for a meter reading of 3.0mA.

6. Adjust R55 on PCB B100 (R51 on B300) (**Figure 3 in kV Calibration part**) to display 0.2 on the mA display during a 36kV manual fluoro.

7. During a 80kV manual fluoro exposure adjust R49 on PCB B100 (R68 on B300) (**Figure 3 in kV Calibration part**) so the control panel display matches the actual mA displayed on the DVM. This should be 3.0 mA.

8. During a 36kV manual fluoro exposure verify that the actual mA on the DVM is 0.2mA and the control panel display matches. If the control panel display does not match the DVM mA, repeat steps 7 - 8. If the DVM mA is not 0.2 at 36kV., **repeat steps 4 - 5** .

9. Select the film mode.

10. During a 2 second, 36kV exposure, adjust P2 (**Figure 1**) for a 20mA reading on the multimeter.

11. Replace the mA jumper.

Entrance Exposure

NOTE: Measure the entrance exposure 12 inches (30cm) above the center of the I. I.

1. Replace the X- ray cover.

2. Select the Hip mode.

3. During a manual fluoro 110kV exposure, adjust P8 (**Figure 1**) for the maximum mA (not to exceed 6.0mA) at the control panel.

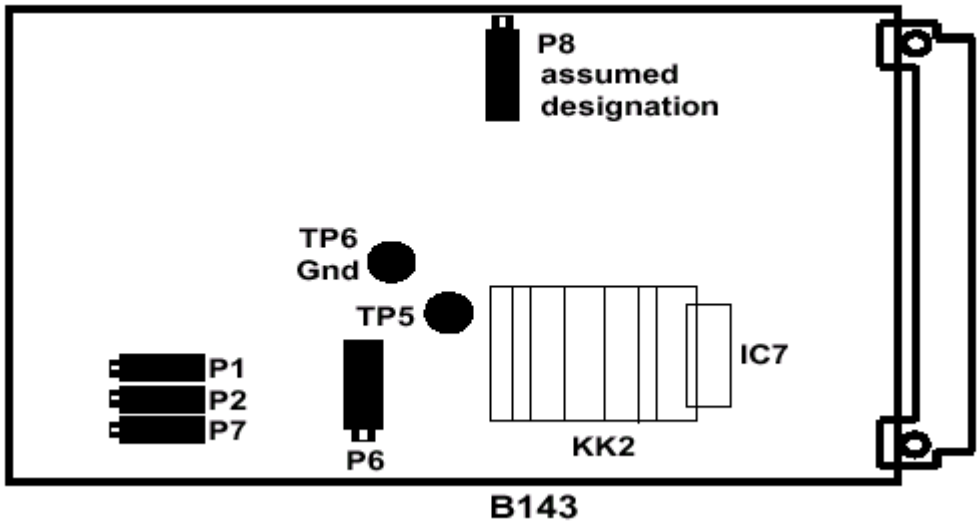

Figure 1

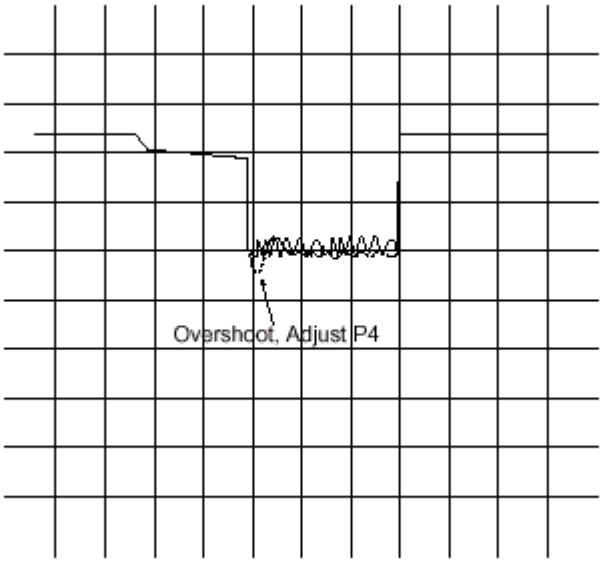

Figure 2

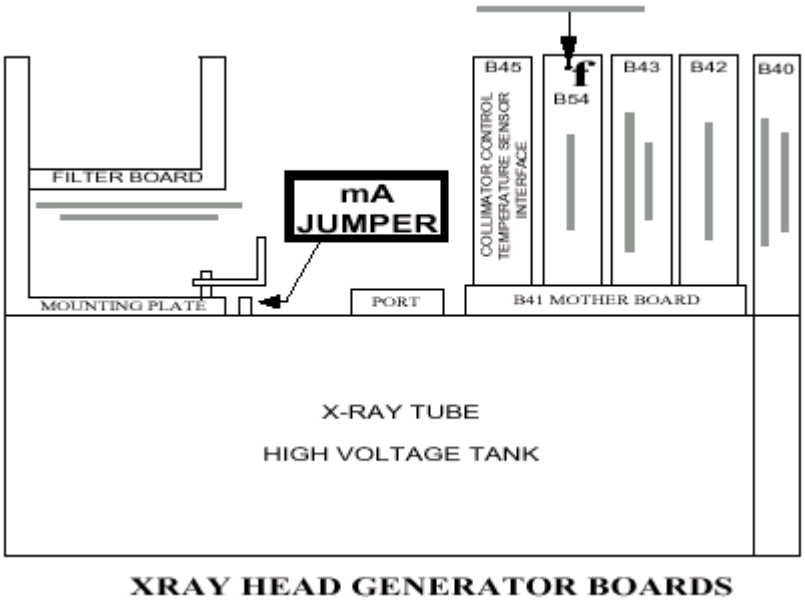

Figure 3